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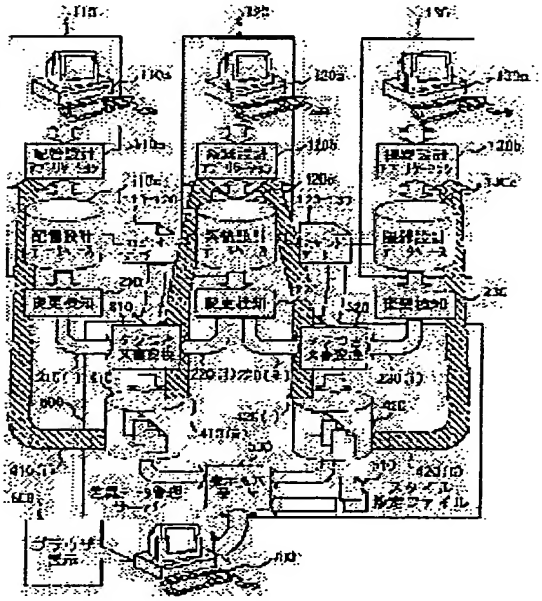
(54) SUPPORT METHOD AND SYSTEM FOR INTEGRATION OF DATABASE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a support method and a system for integration of database, while taking advantage of a database of an actual distributed system, allowing a distributed system to achieve design work influencing upon from an upper stream to a down stream or mutually, and especially allowing a plant design work often proceeded concurrently to achieve integration of databases.
SOLUTION: The support method for integration of database, in an integration system having a plurality of distributed systems composed of terminal devices to output and input data, work-application programs and work-databases and integrating the databases among the databases of the multiple distributed systems, associating attribute items in tables of a plurality of different databases with each other to create mapping documents according to the association and associating attribute values in tag tables with each other according to the created mapping documents to support the integration of the multiple databases based on the association.

図1



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CLAIMS

[Claim(s)]
[Claim 1] The terminal unit and the application program corresponding to business for outputting and inputting data, In the exchange approach which has two or more distributed systems to which it consists of databases corresponding to business, and design business is performed concurrently, and constitutes an integrated system with reference to data among said two or more systems The attribute items in the table of the database with which said plurality differs are matched. The database integrated exchange approach characterized by drawing up a mapping document according to said matching, matching the attribute value in a tag table according to said drawn-up mapping document, and supporting integration of two or more of said databases based on said matching.
[Claim 2] The database integrated exchange approach characterized by matching about the attribute value which detected the difference in the attribute value in said table according to said mapping document, and had said difference in said claim 1.
[Claim 3] The database integrated exchange approach characterized by correcting to the application program corresponding to business which corresponds based on the difference in said detected attributes by outputting a difference request modify in said claim 2.
[Claim 4] The database integrated exchange approach characterized by storing serially the data which matched the attribute value in said generated table in claim 1 publication, and displaying the hysteresis of the correspondence situation between said databases.
[Claim 5] The terminal unit and the application program corresponding to business for outputting and inputting data, In the database integrated system which has two or more distributed design systems with which it consists of databases corresponding to business, and design business is performed concurrently, and refers to data among said two or more systems The mapping document which matches the attribute items in the table of the database with which said plurality differs, The means for matching the attribute value in said table according to said mapping document, A document conversion means with a tag to match the attribute value in a tag table based on the mapping document drawn up according to said matching, the document cumulative file with a tag which memorizes said changed document with a tag — since — the database integrated support system characterized by preparing the constituted difference data control server.
[Claim 6] In said claim 5 said difference data control server A database modification detection processing means to detect that the data of said database were changed, The document inverter with a tag which generates the document with a tag which expresses adjustment maintenance with the mapping data of said database, When a difference arises in either of the databases related while memorizing said generated document The database integrated support system characterized by being the difference data control server which has the document are recording file system with a tag which generates the request-modify signal of the application program data corresponding to business of the corresponding distributed system.
[Claim 7] It is the database integrated support system characterized by being the difference data control server which has display demand reception equipment which can display the difference information which said difference data control server receives the display demand from a terminal unit in said claim 5, and is connected by the difference information between databases, or the data decision item information in the same database according to a display demand.
[Claim 8] It is the database integrated support system characterized by including a document conversion means with a tag to output a correcting signal to the application program corresponding to business of the database which corresponds based on the difference information with which said difference data control server is connected in said claim 6 by the difference information between databases, or the data decision item information in the same database.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the database integrated exchange approach and system for supporting the more efficient signal transduction and the more efficient share of the field concerning plant life cycles, such as a design, operation, maintenance, etc. of a plant, etc. of distributed design business which signal transduction between designers was performed by especially the database, and were specialized.
[0002]
[Description of the Prior Art] The design business of plants, such as atomic energy and thermal power, is usually specialized, it is divided into some phases and design business advances. The first phase of a design is called the "upstream" and a next phase is often called a "lower stream of a river." In its design post of plants, such as atomic energy and thermal power, the design result is stored and managed in each database in connection with a network design, a piping three-dimensions design, an equipment design, etc. These databases have the huge amount of data, and each data is concurrently stored in each database on the character of business.
[0003] That is, since the design of the downstream starts without waiting for the design of the upstream, adjustment management of a database cannot be performed only by stretching the link between databases. Such business does not progress concurrently and has also started the design of the downstream by temporary arrangement of a value, without waiting for an upstream design result. Drawing 2 is the block diagram showing the class of general plant-engineering-design business, and relation between business. Here, the case where the result of business shifts [as an example] towards a lower stream of a river in sequence, such as the network design 10 of a plant, a piping design 20, and an equipment design 30, from the upstream is shown. If that result flows one by one as shown in this drawing, it will be same about the design result of such business, and unification will be maintained. However, in almost all cases, work is concurrently done from the reasons of that a system is actually huge, that many time amount spent on the whole design cannot be taken, there being much number in connection with business.
[0004] For example, if it says in the example of drawing 2 , in the section 10 of a network design, a piping instrumentation diagram is created (10a), and creation (10b) of an equipment list etc. is performed, and the result is stored in network design-database (DB)120C. Moreover, in the section of a piping design, a piping space 3D layout etc. is created (20a), and it stores in a piping design database (DB). Furthermore, in the section of an equipment design, the specification for a device detail design (30a) and order article arrangements (30b) etc. is created, and it stores in device design-database (DB)130C. Since each business is storing data in the database concurrently, it becomes an indispensable condition by the data transfer between DB(s) to reflect the result of each business in the database of one's posts of other.
[0005] Although such a database is called distributed database, supposing it makes it go on without preparing relation between databases, in a distributed database, it is necessary to transmit data to data **-SU of a lower stream of a river to the upstream depending on the advance situation of a lower stream of a river or a design from the upstream, and to maintain the adjustment of data. A database manager will grasp the difference between each database, and such data transfer will judge which value is put in as the newest value, and will usually update the value set up in the database. Decision whether a database is updated or not will take into consideration the opinion for every design post of its concerned, the constraint on a design, etc. However, since it is restricted to those who can use a data transfer tool, that the difference between actual databases can be grasped does not have well desirable working efficiency from a viewpoint of sharing of the information in connection with a database.
[0006] There is an integrated mold database as another gestalt of a database. For example, the conventional relational database is one of typical things of the database of an integrated mold. However, while being a "parent table" and a "child table", external key constraint is prepared for relating. That is, unless the value of parents' table is decided, the value of a child's table cannot be inputted. Therefore, when the business of the upstream and a lower stream of a river is the distributed system of a concurrent ** **** operating gestalt, introducing an integrated mold database only by the relational database and its constraint has unreasonableness.
[0007] Moreover, in the network design and the piping design, there may be circumstances which have developed and introduced the CAD tool and the data input tool uniquely in the past, respectively, and neither the system nor the database management system may necessarily be able to take unification. Therefore, when it is going to shift to an integrated mold database at a stretch from the distributed database used by the conventional operating system, it will become very [in cost] high and the risk of being dependent on one integrated mold database will also be involved. When the attempt of it being said with a document with a tag that the data exchange and a share are

aimed at introduces an XML (Extensible Markup Language) document on the other hand, it has come to carry out. About this, the standardization is internationally advanced by W3C (World Wide Web Consortium, http://www.w3c.org). Moreover, the functor in which an XML document follows is decided in a framework called DTD (Document Type Deinition). DTD can be used also as a document for mapping which determines the correspondence relation between two information. Information can be expressed as the gestalt which a user tends to grasp by building information on a WWW server, using these, and using the document according to XSL (Extensible Styling Language) which determines a display style, if it is going to display on the computer connected to the network.

[0008] Moreover, there is JP,3-278179,A as advanced technology. There is an indication about the drawing retrieval method of the DPS about the drawing retrieval method which retrieves drawing data and design-basis information on CAD with a distributed-processing gestalt. To the main computer, mutual use is aimed at by carrying out unitary possession of drawing attribute data and the design-basis information. However, information is stored concurrently and there is no indication about aiming at mutual use.

[0009]

[Problem(s) to be Solved by the Invention] As the term of said Prior art described, a problem produces introducing an integrated mold database into an operating dependence system different, respectively from a concurrent operating advance of a plant engineering design in continuous and continuous use of cost and a system. However, when it applies by the distributed database, there is a trouble that the adjustment maintenance between databases becomes in inefficient.

[0010] This invention aims at offering the integrated exchange approach and system of a database applicable to concurrent business, employing the distributed system of a conventional type efficiently using a mapping document like DTD which matches the attribute items in a table in two or more DB(s), in order to solve the above technical problems.

[0011]

[Means for Solving the Problem] Said technical problem is solvable by the following exchange approaches and the system. The terminal unit and the application program corresponding to business for outputting and inputting data, In the exchange approach which has two or more distributed systems to which it consists of databases corresponding to business, and design business is performed concurrently, and constitutes an integrated system with reference to data among said two or more systems The attribute items in the table of the database with which said plurality differs are matched. A mapping document can be drawn up according to said matching, the attribute value in a tag table can be matched according to said drawn-up mapping document, and it can solve by the exchange approach which supports integration of two or more of said databases based on said matching.

[0012] Moreover, the thing to match about the attribute value which detected the difference in the attribute value in said table according to said mapping document, and had said difference, Moreover, the thing corrected to the application program corresponding to business which corresponds based on the difference in said detected attributes by outputting a difference request modify, Moreover, the data which matched the attribute value in said generated table can be stored serially, and it can solve by the exchange approach by displaying the hysteresis of the correspondence situation between said databases etc.

[0013] Moreover, the terminal unit and the application program corresponding to business for outputting and inputting data, In the database integrated system which has two or more distributed design systems with which it consists of databases corresponding to business, and design business is performed concurrently, and refers to data among said two or more systems The mapping document which matches the attribute items in the table of the database with which said plurality differs, The means for matching the attribute value in said table according to said mapping document, A document conversion means with a tag to match the attribute value in a tag table according to the mapping document drawn up according to said matching, the document cumulative file with a tag which memorizes said changed document with a tag — since — it is solvable with the database integrated support system which prepared the constituted difference data control server.

[0014] Moreover, a database modification detection processing means by which said difference data control server detects that the data of said database were changed, The document inverter with a tag which generates the document with a tag which expresses adjustment maintenance with the mapping data of said database, When a difference arises in either of the databases related while memorizing said generated document The database integrated support system which has the difference data control server which has the document are recording file system with a tag which generates the request-modify signal of the application program data corresponding to business of the corresponding distributed system, Moreover, said difference data control server The display demand from a terminal unit is received and a display demand is followed. Using the difference information between databases, or the data decision item information in the same database The database integrated support system which is the difference data control server which has display demand reception equipment which can display the difference information connected, and said difference data control server Using the difference information between databases, or the data decision item information in the same database It is solvable with a support system including a document conversion means with a tag to output a correcting signal to the application program corresponding to business of the database which corresponds based on the difference information connected.

[0015]

[Embodiment of the Invention] The configuration of the database integration system concerning the gestalt of operation of this invention is explained using drawing 1 . The database integration system of this invention is an example in the case of having the piping design system 110, the network design system 120, and the device design

system 130 as an existing system. It is not limited to these three systems. The piping design system 110 is constituted from terminal unit 110a, piping design application (program) 110b as application corresponding to business, and piping design database 110c as operating correspondence DB by this example. Moreover, the network design system 120 consists of terminal unit 120a, network design application (program) 120b as application corresponding to business, and network design-database 120c as operating correspondence DB. Moreover, the device design system 130 consists of terminal unit 130a, equipment-design application (program) 130b as application corresponding to business, and device design-database 130c as operating correspondence DB.

[0016] The environment which matches piping design database 110c and device design-database 130c focusing on network design-database 120c is made by creating and assigning the mapping data 110-120 and 120-130 to the databases 110c, 120c, and 130c of each system. Moreover, it detects whether the database had modification through the modification detection processors 210, 220, and 230 in each database of 110c, 120c, and 130c. this — modification — detection — a result — and — a database — modification — a part — data — about — a signal — 210 — (— i —) — 220 — (— i —) — 220 — (— ii —) — 230 — (— i —) — input data — ** — carrying out — a difference — data control — a server — 600 — a document with a tag — the adjustment condition between databases — managing .

[0017] Here, a tag means the descriptor made from the information which carries out semantic attachment to data, i.e., an attribute name etc. In the difference data control server 600, when the signal of either a signal 210 (i) or the signal 220 (i) occurs, document transform-processing equipment 310 with a tag starts using the mapping data 110-120, the document with a tag showing the adjustment maintenance situation of the databases 120c and 110c of a network design-database-piping design is generated, and it accumulates in the document are recording file system 410 with a tag. The document are recording file system 410 with a tag outputs the data request modify 410 (i) and 410 (ii) to each operating applications 110b and 120b, when a difference is detected in a correspondence situation between the databases of a network design-piping design.

[0018] Similarly, when the signal of either a signal 220 (ii) or the signal 230 (i) occurs, document transform-processing equipment 320 with a tag starts using the mapping data 120-130, the document with a tag showing the adjustment maintenance situation of the databases 120c and 130c of a network design-database-equipment design is generated, and it accumulates in the document are recording file system 420 with a tag. The document are recording file system 420 with a tag outputs the data request modify 420 (i) and 420 (ii) to each operating applications 120b and 130b, when a difference is detected in a correspondence situation between the databases of a network design-piping design, and it performs correction of network design application program 120b or equipment-design application program 130b.

[0019] Moreover, the display demand from a user is processed with display demand reception equipment 500 by the terminal unit 700 connected to the network apart from the existing system, and the browser 800 mounted in this. Under the present circumstances, the document with a tag which display demand reception equipment 500 needs is chosen from the document are recording file systems 410 or 420 with a tag, is chosen from the style configuration file 510 which also prepared the display gestalt beforehand, and generates the display screen.

[0020] Drawing 3 is drawing showing the flow of the whole document transform processing with a tag (310 or 320) of the difference data control server 600 of drawing 1 . Processing of the document transform-processing equipments 310 and 320 with a tag is started in response to the modification detection equipments 210 or 220 or the trigger signal by detection of the renewal of data from 230, when there is updating by either piping design database 110c, network design-database 120c or device design-database 130c.

[0021] The document transform-processing equipments 310 or 320 with a tag receive the parameter of the design-change part included in a trigger signal (STEP 11). A plant name, a building name, a systematic name, etc. are included in this parameter.

[0022] two kinds if the case where it is designing is now considered about the data of one plant, when two or more assignment of the building is carried out (STEP 12, Yes), in case one building is specified (STEP 12, No) — it is . and two kinds even if it is two or more cases, when two or more assignment of the network is carried out [whether it is the whole, whether it is a part, and] about each of STEP 14, and (Yes, NO) (STEP 13, Yes), in case one network is specified (STEP 13, No) — it is .

[0023] A total of four kinds of file-generating processings with a tag arise above (STEP 15-1-15-4). Anyway, it is possible to use one file-generating processing with a tag in common.

[0024] Drawing 4 is drawing showing the flow of the file-generating processing with a tag of said drawing 3 , and detail processing of STEP 15-1. Here, in piping design database 110c of drawing 1 , detail processing of file generating with a tag in document transform-processing equipment 310 with a tag is described, assuming that there was a certain modification.

[0025] In this case, the document with a tag about the correspondence relation of the data of piping design database 110c and network design-database 120c is generated first (STEP 15-a). Next, it extracts from correspondence-related information about the part which is different between databases, and the document with a tag which expresses the information about difference relation among correspondences between databases is generated (STEP 15-b). Furthermore, STEP The hysteresis graph of the number of differences is generated using the difference relation of the past accumulated by making it such as what draws up the difference-related document with a tag which it is using by 15-b whenever there is renewal of Databases 110c and 120c (STEP 15-c). Furthermore, the graph about the number of a related difference is generated using a document with a tag difference-related [belonging to the network of the same classification] (STEP 15-d).

[0026] Drawing 5 is drawing showing the relation at the time of carrying out matching of a network design database and a piping design database by the document with a tag. For example, drawing 5 (a) shows the example of description of the mapping data 110-120 at the time of following DTD (Document Type Definition) which is the functor of following the document specification with a tag internationally standardized by W3C (World Wide Web Consortium, http://www.w3c.org), i.e., XML, in matching of piping design database 110c and network design-database 120c. In this example, when the attribute item set which should be compared is defined as ROW, things, such as a building, a network number, a line number, and a maximum allowable working pressure, are in ROW. It is developed and described that correspondence-related information said that the information furthermore compared as a building had an attribute item of the building by the side of a network design database, and an attribute item of NT by the side of a piping design database hierarchical. As for the tag, drawing 5 (a) showed the piping data comparison, and only the party of the multi-lines showed the example of description.
[0027] Drawing 5 (b) displays the contents of (a) in graph. That is, the attribute item set ROW which should be compared from the contents of a piping data comparison recognizes multi-line existence. The information that multi-line existence is recognized is expressed with * currently attached on ROW. * If there is nothing, it will become the semantics that one exists. And there is information, such as the building comparison 110-120-1, the network number comparison 110-120-2, the line-number comparison 110-120-3, the maximum-allowable-working-pressure comparison 110-120-4, and the maximum-service-temperature comparison 110-120-5, as a component of ROW. Furthermore, it is the hierarchy organization that NT by the side of the building by the side of a network design and a piping design is matched as low order information on the building comparison 110-120-1 etc. The attribute value of an actual database is matched using the relation of matching expressed with this drawing 5 (b).
[0028] Drawing 5 (c) shows an example of the actual contents of a database. For example, it is the example which matched the table about the plant A of network design-database 110c, and the table about the plant A of piping design database 120c. For example, correspondence is attached for every line and every ROW by 110-120-1c, the network number, and 110-120-3c, a maximum allowable working pressure and 110-120-4c, maximum service temperature and the relation [NT / a building and / LB / LC / 110-120-2c, a line number, and / LG / LH] 110-120-5c. As [express / with drawing 5 (a) and (b) / this relation]
[0029] Drawing 6 is the correspondence relation generation processing STEP of drawing 4 . It is drawing showing the example of the document with a tag generated by 15-a. When the correspondence relation between databases is expressed with XML as an example of a document with a tag, it is expressed like drawing 6 , and this matching is carried out using the actual attribute value of drawing 5 (c) using the mapping data which express with drawing 5 (a) or drawing 5 (b). That is, the whole correspondence relation is expressed with inserting an informational head and the informational last with the tag <a piping data comparison> and <a /piping data comparison>. & lt; in piping data comparison >, "A", "2001/4/22 18:14:56", and "100" can also be written as a parameter of a plant code, modification time, and the number of data, respectively. The <ROW </ROW>> tag expresses the set of correspondence-related of actual data inside the tag of <a piping data comparison <a /piping data comparison>>. The serial number of the data num="0" can be given in the <ROW> tag. Inside the <ROW> tag, the semantic information on attributes to match, such as <a building comparison <a /building comparison>>, <a network number comparison> <a /network number comparison>, <a line-number comparison> <a /line-number comparison>, <a maximum-allowable-working-pressure comparison> <a /maximum-allowable-working-pressure comparison>, and <maximum service temperature> </maximum service temperature>, is expressed. In each tag, attribute value is inserted by <the building <a /building>>, <NT> </NT>, etc., and the correspondence relation of an actual database is written concretely.
[0030] Drawing 7 is the difference extract processing STEP of drawing 4 . It is drawing showing the example of the document with a tag generated by 15-b. It is generated based on the correspondence-related document with a tag generated by drawing 6 , and if a certain difference is different of at least one attribute between databases, the document with a tag about a difference will be generated in a line unit, i.e., a ROW unit. About a <piping data comparison </piping data comparison>> tag and the <ROW </ROW>> tag, it is the same as that of what was explained by drawing 6 . The information that it carries out to <a building comparison <that which is different between attribute value to the tag showing the semantic information on attributes to match, such as /building comparison >, for example, <maximum-allowable-working-pressure> 3.43< / maximum allowable working pressure,>> like diffFlag="different" to a thing like 1111 </LG>, and a difference is in a tag is stored.
[0031] Namely, < maximum allowable working pressure It expresses that a difference is in the maximum allowable working pressure of network design-database 120c, and LG of the piping design database 110 with diffFlag="different"> <a /maximum allowable working pressure>.
[0032] By the system which consists of the above configuration and processing, the condition of the adjustment of an attribute which should show the same value between databases can be managed and grasped.
[0033] Drawing 8 is drawing showing the flow of the processing at the time of generating the display screen according to a demand of a user. Using the browser 800 mounted in the terminal 700 of drawing 1 , a user specifies a plant name (STEP 71 [A], for example, a plant), and specifies a systematic name (STEP 72, for example, E11). Display demand reception equipment 500 waits for a display demand (STEP 73). If a display demand is a correspondence relation display (STEP 74, Yes), a correspondence relation display will be carried out (STEP 75 and this example of a display are shown in drawing 9). Difference relation will be displayed if a display demand is not a correspondence relation display (STEP 74, No) but a difference relation display (STEP 76, Yes) (STEP 77 and this example of a display are shown in drawing 10).

[0034] If a display demand is not a difference relation display (STEP 76, No) but a difference hysteresis display (STEP 78, Yes), a difference hysteresis display will be carried out (STEP 79 and this example of a display are shown in drawing 11). If a display demand is not a difference hysteresis display (STEP 78, No) but a related difference display (STEP 80, Yes), a difference hysteresis display will be carried out (STEP 81 and this example of a display are shown in drawing 12). Thus, it is a cooling system (E51) etc. in the item to which plurality related, i.e., the example of drawing 12 , at the time of a residual heat removal system (E11), a high pressure core injection system (E22), and isolation. And if it is not which case, either, it will return to the waiting for a display demand (STEP 73).
[0035] Drawing 9 is an example of the display screen generated by processing of drawing 8 , and is drawing showing the example of the screen generated using the document with a tag generated by correspondence relation generation processing. The relation corresponding to a piping data comparison is displayed on a window 700 (a). For example, A plant is chosen from a pull down menu 701 as a plant name, and as a network, after choosing E11 residual heat removal system 702 from a tree menu, if the correspondence relation display carbon button 703 is pushed, the correspondence relation between each attribute will be displayed on the lower right window 707 by the piping numerical order like a maximum allowable working pressure, LG and maximum service temperature, and LH. This is generated based on a document with a tag as shown in drawing 6 . A total of 708 data can also generate and display the information like 100 by extracting from the information on the number of data of the document with a tag of drawing 6 .
[0036] Drawing 10 is also an example of the display screen generated by processing of drawing 8 , and is drawing showing the example of the screen generated using the document with a tag generated by difference extract processing. The difference relation of a piping data comparison is displayed on a window 700 (b). For example, like drawing 9 , A plant is chosen from a pull down menu 701 as a plant name, and as a network, if the difference relation display carbon button 704 is pushed after choosing E11 residual heat removal system 702 from a tree menu, what has a difference in the lower right window 709 among the data of the line writing direction of a table of a database will be displayed on a piping numerical order like a maximum allowable working pressure, LG and maximum service temperature, and LH. Among those, about different data, highlighting is carried out like 710. This is generated based on a document with a tag as shown in drawing 7 . The information like 5 on the total number (711) of data also indicates by generation by extracting from the information on the number of data of the document with a tag of drawing 7 .
[0037] Drawing 11 is also an example of the display screen generated by processing of drawing 8 , and is drawing showing the example of the screen generated using the document with a tag generated by difference hysteresis graph generation processing. The difference hysteresis of a piping data comparison is displayed on a window 700 (c). For example, like drawing 9 , A plant is chosen from a pull down menu 701 as a plant name, and as a network, if the difference hysteresis display carbon button 704 is pushed after choosing E11 residual heat removal system 702 from a tree menu, the hysteresis of a total of the line count of a certain thing of a difference will be displayed on the lower right window 712 in order of the date among the data of a line writing direction of the table of a database. This difference hysteresis graph is indicating by generation about the document with a tag as shown in drawing 7 , using two or more what was generated for every renewal of data.
[0038] Drawing 12 is also an example of the display screen generated by processing of drawing 8 , and is drawing showing the example of the screen generated using the document with a tag generated by related difference graph generation processing. The number of the difference of a piping data comparison is displayed on a window 700 (d). Like drawing 9 , for example, as a plant name from a pull down menu 701 If the related difference display carbon button 704 is pushed after choosing A plant and choosing E11 residual heat removal system 702 from a tree menu as a network A cooling system 713 (iii) is displayed on the lower right window 713 in the total of the line count of a certain thing of a difference among the data of a line writing direction of the table of a database at the time of the E22 high-pressure-core-injection-system 713(ii) E51 isolation relevant to E11 residual heat removal system 713 (i). Here, for example, the network number has chosen as a related network what starts in E. This difference related graph is indicating by generation about the document with a tag as shown in drawing 7 , using two or more what was generated for every network.
[0039] Drawing 13 is drawing showing the example which has inputted the comment into difference data, when the screen of drawing 10 is displayed. For example, when a difference is in the cel which can be determined by the line number 002 and LG by drawing 13 and this is clicked, a network E11, a line number 002, and a window 720 called the comment to LG are displayed, and, as for the maximum allowable working pressure (LG) of "piping design side database, a value is set up temporarily. Formal value setting waiting of a network design side database. 4/24 A comment called its piping design post A" is filled in and registered. Thereby, the background about the correspondence situation and difference situation of data and that suggestion information which should be corrected how can be matched with data, and can be managed.
[0040] Furthermore, this invention can manage and display the condition of the adjustment of an attribute which should show the same value between databases by detecting the difference in the value set up between DB(s) using the mapping document which matches the attribute items in a table in two or more DB(s).
[0041] Moreover, in this invention, the information which shows the completeness of the activity relevant to the activity concerned can be acquired by generating the document in which matching of the data between databases is shown, and the document in which a difference is shown each time using the result of having detected the update information for every database automatically, and leaving the hysteresis of adjustment maintenance of a database.
[0042] Moreover, in this invention, when correspondence sticks between databases and a difference is in the value

of the data which should be the same, the information which carries out adjustment maintenance of data actively can be outputted by advancing a data request modify to the operating application side which set up the original data conversely.

[0043] Furthermore, by matching with the display information about the correspondence situation and difference situation of data between databases, and registering a check comment, this invention can match with data the background about the correspondence situation and difference situation of data, and that suggestion information which should be corrected how, and can manage it.

[0044] Moreover, according to this invention, all the revision histories of the past of the data created according to the activity concerned can also be grasped. Furthermore, the difference in the past of the data created according to the activity concerned is decreasing how by the present, or the completeness of an activity can be grasped. Moreover, the information which carries out actively grasping the difference in the data of the item relevant to the difference in the data created according to the activity concerned, and grasping the completeness of a related activity or adjustment maintenance of data can output, and the effectiveness that the background about that the activity in connection with adjustment maintenance can promote or the correspondence situation of data, and a difference situation and that suggestion information which should correct how match with data, and can manage can expect.

[0045]

[Effect of the Invention] Integration of the database which can respond to concurrent business is realizable, employing the distributed process input output equipment conventional system efficiently according to this invention, as explained above.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the database integration system concerning the gestalt of operation of this invention.
[Drawing 2] It is drawing showing the class of general plant-engineering-design business, and relation between business.
[Drawing 3] It is drawing showing the flow of the whole document transform processing with a tag in the difference data control server of drawing 1 .
[Drawing 4] It is drawing showing the flow of detail processing of file generating with a tag.
[Drawing 5] It is drawing showing the relation of matching between a network design database and a piping design database.
[Drawing 6] It is drawing showing the example of the document with a tag generated by correspondence relation generation processing.
[Drawing 7] It is drawing showing the example of the document with a tag generated by difference extract processing.
[Drawing 8] It is drawing showing the flow of the processing at the time of generating the display screen according to a demand of a user.
[Drawing 9] It is drawing showing the example of the screen generated using the document with a tag generated by correspondence relation generation processing.
[Drawing 10] It is drawing showing the example of the screen generated using the document with a tag generated by difference extract processing.
[Drawing 11] It is drawing showing the example of the screen generated using the document with a tag generated by difference hysteresis graph generation processing.
[Drawing 12] It is drawing showing the example of the screen generated using the document with a tag generated by related difference graph generation processing.
[Drawing 13] When the screen of drawing 10 is being displayed, it is drawing showing the example which has inputted the comment into difference data.
[Description of Notations]
110; piping design system 120; network design system 130; device design system 110a, 120a, 130a; — terminal unit 110b; piping design application (program) 120b; network design application (program) 130b; equipment-design application (program) 110c; piping design database 120c; network design database 130c; device design database 110-120 and 120-130; mapping data 210, 220, and 230; modification detection processor 310 and document transform-processing equipment with a 320; tag 410, document are recording file system with a 420; tag 500; display demand reception equipment 600; difference data control server 700; terminal 800; browser

[Translation done.]

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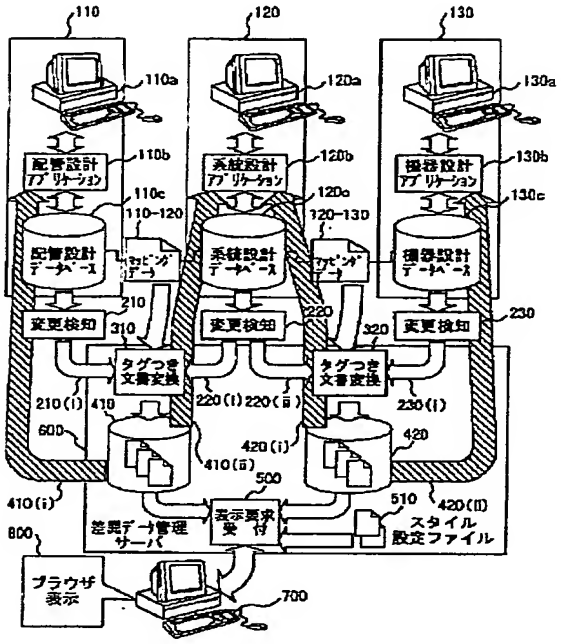
DRAWINGS

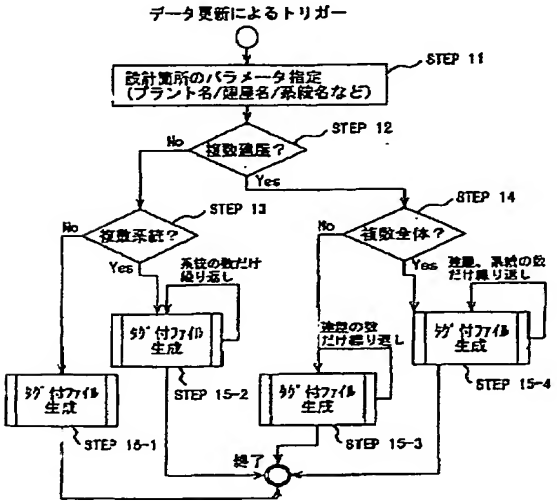
[Drawing 1]

図 1



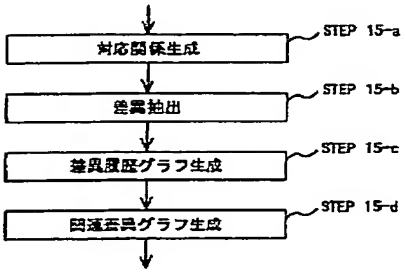
[Drawing 3]

図 3



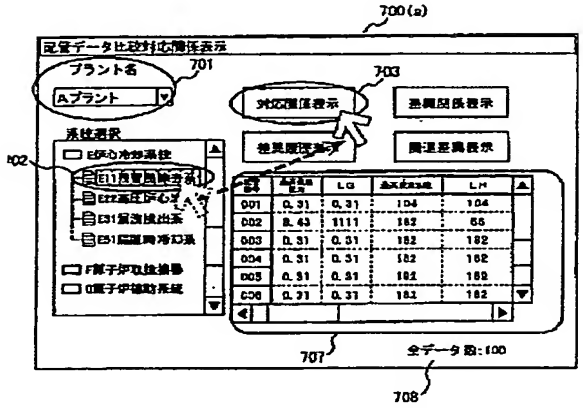
[Drawing 4]

図 4



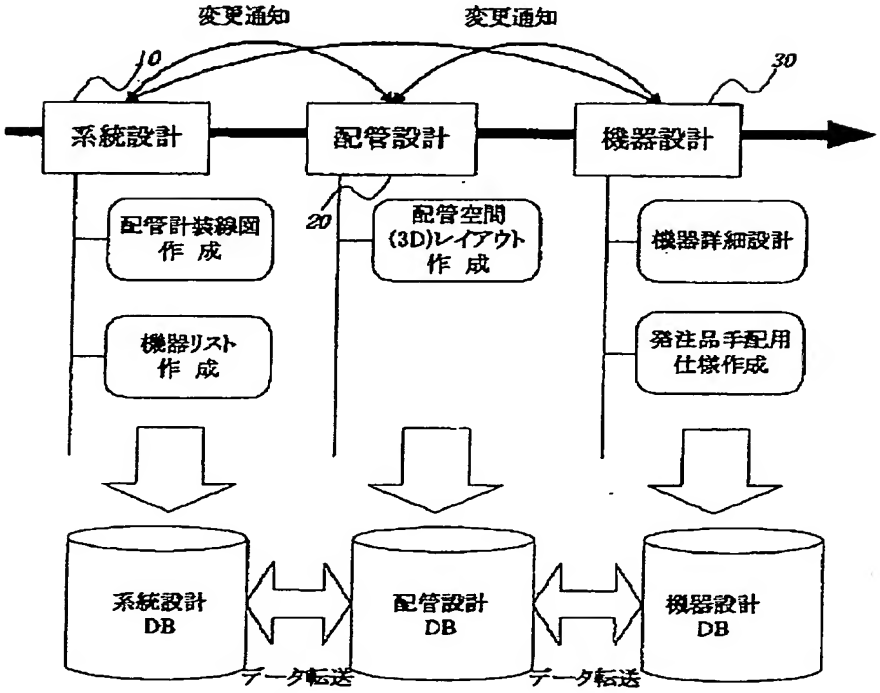
[Drawing 9]

図 9



[Drawing 2]

図 2



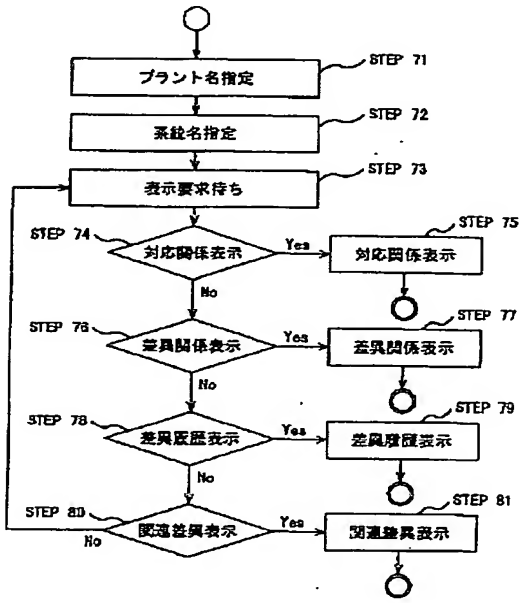
[Drawing 6]

図 6

```
<配管ﾃﾞｰﾀ比較 ﾌﾟﾗﾝﾄｺｰﾄﾞ="A"更新時刻="2001/4/22 18:14:56"ﾃﾞｰﾀ数="100">
 <ROW num="0">
    <建屋比較>
      <建屋>R</建屋>
      <NT>R</NT>
    </建屋比較>
    <系統番号比較>
      <系統番号>E11</系統番号>
      <LB>E11</LB>
    </系統番号比較>
    <配管番号比較>
      <配管番号>001</配管番号>
      <LC>001</LC>
    </配管番号比較>
    <最高使用圧力比較>
      <最高使用圧力 >0.31</最高使用圧力>
      <LG>0.31</LG>
    </最高使用圧力比較>
    <最高使用温度比較>
      <最高使用温度>104</最高使用温度>
      <LH>104</LH>
    </最高使用温度比較>
  ...
  </ROW>
 ...
</配管データ比較>
```

[Drawing 8]

図 8



[Drawing 5]

図 5

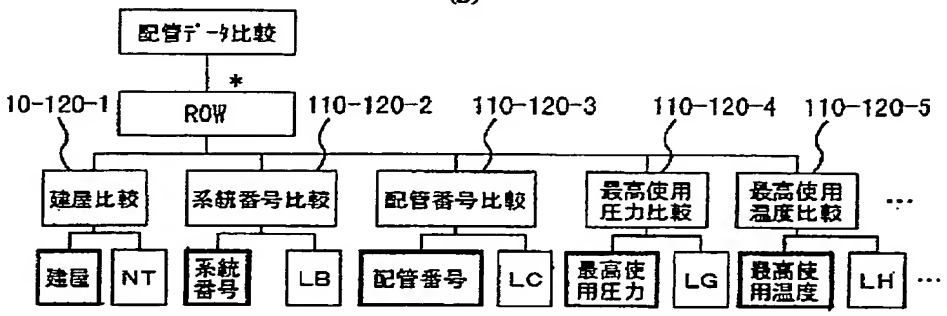
(a)

110-120-2

DTDの例
(系統設計、配管設計DBの対応付)

```
<!ELEMENT 配管データ比較(ROW*)>
  <!ATTLIST 配管データ比較 プラントコード CDATA #REQUIRED>
  ...
<!ELEMENT ROW      (建屋,
                    系統番号,
                    配管番号,
                    最高使用圧力,...>
  <!ELEMENT 建屋比較(建屋,NT)>
    <!ELEMENT 建屋(#PCDATA)>
    <!ELEMENT NT(#PCDATA)>
...
```

(b)



(c)

系統設計側DBのプラントAに関するテーブル

建屋	系統番号	配管番号	最高使用圧力	最高使用温度
R	E11	001	0.31	104
R	E11	002	3.43	182
...	...	...	...	...

110-120-5c
110-120-2c
110-120-3c
110-120-4c
110-120-1c

NT	LB	LC	LG	LH
R	E11	001	0.31	104
R	E11	002	1111	68
...	...	...	...	...

配管設計側DBのプラントAに関するテーブル

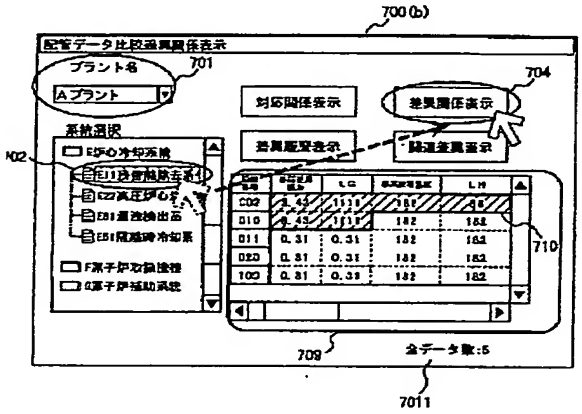
[Drawing 7]

図7

```
<配管データ比較 プラントコード="A" 更新時刻="2001/4/22 18:14:56" データ数="5">
  <ROW num="0">
      ....
  </ROW>
  <ROW num="1">
    <建屋比較>
      <建屋>R</建屋>
      <NT>R</NT>
    </建屋比較>
    <系統番号比較>
      <系統番号>E11</系統番号>
      <LB>E11</LB>
    </系統番号比較>
    <配管番号比較>
      <配管番号>002</配管番号>
      <LC>002</LC>
    </配管番号比較>
    <最高使用圧力比較 diffFlag="different">
      <最高使用圧力>3.43</最高使用圧力>
      <LG>1111</LG>
    </最高使用圧力比較>
    <最高使用温度比較 diffFlag="different">
      <最高使用温度>182</最高使用温度>
      <LH>66</LH>
    </最高使用温度比較>
  ...
  </ROW>
  ...
</配管データ比較>
```

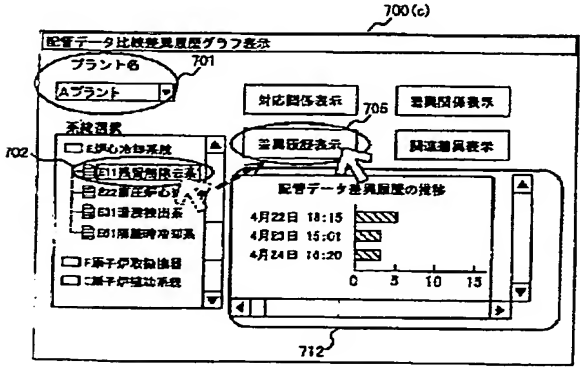
[Drawing 10]

図 10



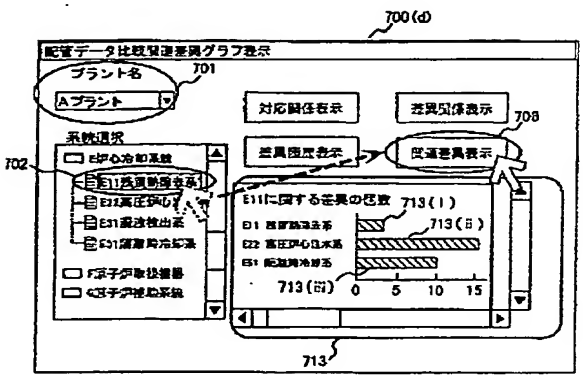
[Drawing 11]

図 11



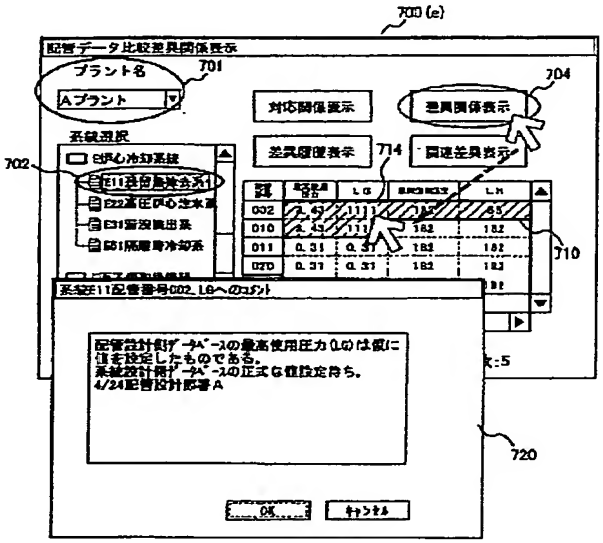
[Drawing 12]

図 12



[Drawing 13]

図 13



[Translation done.]